



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ASIA.—*Asiatic News*.—Sibiriakoff, the friend and patron of Nordenskjöld, during the summer of 1884 ascended the Petchora to Oromets, then crossed the Ural to the Sigva or Whitefish river, which flows in the Sosva affluent of the Obi, and reached Shikurik Sept. 2. The journey demonstrates that a trade route is open in this direction in summer.—Cols. Lockhart and Woodthorpe have been despatched with a party to Gilghit, and it is intended that full surveys of the region lying to the north-west of Kashmir shall be executed. Several passes of no great difficulty here lead towards the Russian possessions, which approach closely.—Colonel Woodthorpe has just completed a journey through the Singpho country. He penetrated into the land of the Bor Khamptis on the northern Irawadi, where no traveler is believed to have been since Lieutenant Wilcox's tour in 1828. Several mines lie north-east of Pedan, the capital, and are worked by an inferior and half-subject race called Khanungs. The Irawadi is unnavigable at Pedan.—The journeys of Dr. Neis in Central Taos (more than 3000 miles) have resulted in a vast amount of information regarding the commercial routes of the western basin of the Mekong, the anthropology and ethnology of the Laos and the Khas, and the social, commercial and political condition of the regions visited.

EUROPE.—*European News*.—Recent examination of bench marks made in 1851 along the Swedish coast of the Baltic show that the movement of elevation was continued in the north, and that of depression in the south of the Scandinavian peninsula. Compared with previous observations, the results prove that since 1750 the head of the Gulf of Bothnia has risen 2.10 meters. About Calmar and Carlsrona no change of level could be detected, but the general result is an elevation of the Swedish coast at the mean rate of 1.60 meter per century.—Four arctic expeditions are said to be projected for next year. Holland will send one, Denmark one and Portugal, newly awakened, it would appear, to the love of discovery, will send two. All propose to visit the Russian islands of the glacial ocean, but the Danish expedition will specially explore the Kara sea, to define as far as possible the unknown region which is supposed to lie to the north-east of Novaya Zemlya.—The captains of several Norwegian steamers despatched to Greenland for seal-hunting, report that the east and south coasts are so obstructed by ice that no seals have been killed.—The population of Iceland in 1880 was 72,445, all of whom were Lutherans, except 3 Mormons, 1 Catholic, 1 Unitarian, 1 Methodist and 3 of no religion in particular.

GEOLOGY AND PALÆONTOLOGY.

ON THE PRESENCE OF ZONES OF CERTAIN SILICATES ABOUT THE OLIVINE OCCURRING IN ANORTHOSITE ROCKS FROM THE RIVER SAGUENAY.—While engaged during the summer of 1884

in making a geological examination of a portion of what has proved to be a very extensive area of anorthosite rocks, which belong to what has been called the Norian or Labrador series, occurring about Lake St. John and the Upper Saguenay, and which from thence strikes far away to the north, I noticed in many of these rocks a mineral which weathered to an orange color and which, when the weathered surface of a specimen containing it was carefully examined, was invariably seen to be surrounded by a narrow light green border. On my return to Ottawa in the fall a large number of thin sections of these rocks were prepared and were found on examination to exhibit a most interesting phenomenon, which I propose here to describe briefly.

The mineral olivine has never heretofore been mentioned as occurring in the Norian series in Canada, although Dr. Hunt, I believe, has mentioned it as a constituent of certain boulders of anorthosite rock, referable to this series, which were found in New Hampshire, but which were probably carried thither from Canada during the glacial age. The mineral, however, occurs abundantly in the anorthosite of many parts of the Saguenay area, and I have also found it in a specimen from a little area of rocks which has been referred to this series, and which occurs near Dolin's lake, in New Brunswick.

When thin sections of the massive or nearly massive dark violet anorthosite from the shore of Lake St. John, near the Little Discharge of the Saguenay, is examined with the microscope, the rock is found to be composed of plagioclase, olivine and iron ore. The plagioclase occurs in large well twinned individuals, which are seldom broken or twisted, and which between crossed trichols show nothing of the peculiar, wavy appearance so often seen in the feldspar of the Laurentian gneiss. The iron ore which is present only in small amount is probably titaniferous, as in one slide a grain of it is seen partially altered to leucoxene. The olivine, of which the rock usually contains a large quantity, occurs either in single individuals, or especially in the larger grains, as several individuals united to form one grain. They seldom have any resemblance to proper crystalline forms, but one usually irregular in shape, a single individual sometimes forming a very irregular elongated string. It is recognized by its biaxial character, high index of refraction and imperfect cleavage, and although like the plagioclase very fresh, by the presence of a little serpentine which here and there may be detected along the cracks which traverse it. The olivine, as is usually the case in eruptive rocks, crystallized before the plagioclase and therefore lies imbedded in it; but although I have examined a very large number of thin sections of this rock, I have never been able to find these two minerals in contact, there being invariably two zones of certain other silicates surrounding the olivine and intervening between it and the plagioclase, so that since the rock consists almost entirely of these

two minerals, every grain of olivine is seen to be completely surrounded by this double zone.

The zone, next to the olivine, is colorless, or nearly so, but often shows a slight pleochroism with reddish and greenish tints. It is formed of small individuals grown compactly together and considerably elongated in a direction at right angles to the surface of the olivine. When examined with a high power the mineral is seen to possess two sets of imperfect cleavages, and when these cross one another at right angles, the direction of extinction bisects the right angle. When cut perpendicular to an optic axis, it shows the revolving bar of a biaxial crystal.

The second zone, or that next to the plagioclase, forms a fringe about the zone just described and consists of minute needles of a light green fibrous mineral arranged at right angles to the surface of the inner zone and penetrating into the plagioclase, so that their examination is attended with considerable difficulty. They are, however, seen to be slightly pleochroic with different shades of green and to have an extinction which makes a small angle with the length of the fibers. It has exactly the appearance of actinolite, as that mineral is generally seen in thin sections, and that it is really a variety of hornblende is proved by the fact that in another specimen of the same rock collected a few miles away, in which the zones are still seen in all their perfection, the outer one is no longer fibrous, but shows the cleavage and absorption characteristic of hornblende.

The olivine and the minerals composing the two zones are entirely differently orientated, and the breadth of the zones does not bear any absolutely constant relation to the size of the olivine grain as seen in the slide, since this latter would vary greatly, according to the direction in which the section passed through it. The inner zone, however, is always smaller than the outer one.

Although the mineral forming the inner zone has the characters of a pyroxene, no conclusive evidence as to its nature could be obtained from the sections of this rock. Similar double zones are, however, found about the olivine in rocks from other parts of the area having the individuals of the inner zone better developed. In these the pleochroism and rude cleavage are very distinct. In a section of one of these rocks a grain of pyroxene exactly resembling the mineral of the inner zone, but not associated with the olivine, was so cut that it could be proved to be a rhombic pyroxene, in that on a basal section known by the cleavages being at right angles a bisectrix could be seen. It may therefore be said that the inner zone is *probably* composed of a rhombic pyroxene, while the outer one is certainly hornblende.

Positive information respecting the nature of the mineral forming the inner zone can only be obtained by separating some of it by means of a heavy solution and examining the powder so obtained. This I propose to attempt, and will make known the

result in a paper on these rocks which is now in course of preparation.

Although these zones have been mentioned by three or four writers, Dr. Törnebohm, who first observed them in certain gabbros from Sweden (Neues Jahrbuch für Mineralogie, &c., 1877, p. 383), is, so far as I am aware, the only one who has described them. Owing to the kindness of that gentleman I have had an opportunity of examining thin sections of a number of these Swedish rocks. The double zone is well seen in them, but is much smaller than in the Canadian rocks, and the minerals composing it accordingly more difficult to determine. Dr. Törnebohm, although unable from his sections to determine the nature of the inner zone, rightly regarded the outer one as hornblende.

The chief interest attached to these zones arises from the fact that, as Törnebohm remarks, they appear to have originated from a mutual reaction between the olivine and the plagioclase. An examination of the thin sections of the Saguenay rock impresses one strongly with the conviction that they have resulted from the action of the molten plagioclase magma on the olivine grains, which in eruptive rocks always separate out before the plagioclase, thus having an origin similar to the kelyphite zones about pyrope described by Schrauf, and somewhat analogous to the zones about olivine and hornblende in volcanic rocks, which have recently attracted so much attention. The subject is one of importance as indicative of the processes at work in the genesis of rocks, and also as throwing some light on the much discussed question of the origin of these anorthosite rocks.—*Frank D. Adams, Geological Survey of Canada.*

Eocene PADDLE-FISH AND GONORHYNCHIDÆ.—The *Polyodontidæ* or paddle-fish are only known from the American and Chinese rivers, and no trace of them has been found hitherto in the records of earlier periods of time. It is therefore of much interest to zoölogy that I am able to announce the existence of remains of a species of this family in the Eocene Green River shales of Wyoming Territory. This determination is based on a skull, of which one side is fairly well preserved, of an individual of the size of a middle-aged specimen of the common paddle-fish (*Polyodon folium*). The long snout is somewhat damaged, but was less dilated than in that species, being intermediate in character between the snouts of the American and Chinese forms (*Psephurus gladius*). The stellate bones are smaller and more attenuated than in the *P. folium*, and the gape of the mouth is not quite so wide. The symphyseal bone, enclosing Meckel's cartilage behind, is much smaller. There is a bone in contact with the front of the operculum below, which may be one of two or three elements, which is apparently not present in *Polyodon*, at least not in that position. For this reason I propose to distinguish this fish generically

from Polyodon. The probable body of this species was described in the NATURALIST, 1883, p. 1152, under the name of *Crossopholis magnicaudatus* Cope.

While the preceding species fixes the age of a type distinctively of the northern hemisphere, I have to add another to those which testify with equal certainty to the presence of southern hemisphere forms as present in North American waters during the Eocene period. This is a member of the family of the Gonorhynchidæ, a group which is now confined to the southern parts of Africa, and to Australia. The species, which is represented in my collection by two fine specimens, is about as large as a fully grown pickerel, but of more slender proportions. The head is short and the mouth small and edentulous. In its generic characters it agrees generally with Gonorhynchus, but differs in the absence of prominent hyoid and pterygoid teeth. The scales are broadly fringed at the margin, like those of the cotemporary genus of Aphredodiridæ, Amphiplaga, and the Trichophanes of the Amyzon beds. The dorsal and anal fins are posterior and opposite. Radii, D. I. 13; V. 8; A. II. 8. Vertebrae Ab. 34 C. 14½. Depth six and three-quarters times in length; head six and a half times in length. The genus and species may be called *Notogoneus osculus*.

A survey of the fish-fauna of the Green River shales yields the following results: Of North American existing fresh-water types we now have represented Lepidosteidæ, Polyodontidæ, Aphododiridæ and Percidæ. Of southern hemisphere types, Gonorhynchidæ and Osteoglossidæ.—*E. D. Cope*.

A CRITIQUE OF CROLL'S GLACIAL THEORY.—A paper before the Geological section of the British Association, by W. F. Stanley, F.G.S., had the following points: The theory of Dr. Croll, accepted by many geologists, is that former glacial periods in the northern hemisphere were due to greater eccentricity of the earth's orbit and to this hemisphere being at the time of glaciation in winter perihelion. This theory is supported upon conditions that are stated to rule approximately at the present time in the southern hemisphere, which is assumed to be the colder. Recent researches by Ferrel and Dr. Hann, with the aid of temperature observations taken by the recent transit of Venus expeditions, have shown that the mean temperature of the southern hemisphere is equal to, if not higher, than the northern, the proportions being 15.4 southern, 15.3 northern. The conditions that rule in the south at the present time are a limited frozen area about the south pole not exceeding the sixtieth parallel of latitude, whereas in the north frozen ground in certain districts, as in Siberia and Northwestern Canada, extends beyond the fiftieth parallel; therefore, by comparison, the north, as regards the latitude in which Great Britain is situated, is at present the most

glaciated hemisphere. As it is very difficult to conceive that the earth had at any former period a lower initial temperature, or that the sun possessed less heating power, glaciation in the north could never have depended upon the conditions argued in Dr. Croll's theory. The author suggested that glaciation within latitudes between 40° and 60° was probably at all periods a local phenomenon depending upon the direction taken by aërial and oceanic currents, as, for instance, Greenland is at present glaciated. Norway has a mild climate in the same latitude, the one being situated in the predominating northern Atlantic currents, the other in the southern. Certain physical changes suggested in the distribution of land would reverse these conditions and render Greenland the warmer climate, Norway the colder.

OCURRENCE OF A DEEP-SEA FORAMINIFER IN AUSTRALIAN MIOCENE ROCKS.—At the meeting of the Royal Society of South Australia, on June 2, Mr. W. Howchin, F.G.S., exhibited a specimen of *Astrorhiza angulosa* as a fossil found in the Miocene strata of Victoria. The specimen was stated to be of more than ordinary interest, inasmuch as it was the first instance in which the genus had been found in the fossil condition in the recent slate. The species submitted was very rare, having been hitherto known to occur only at two localities, one of these being at a *Challenger* station to the east of the Azores, at a depth of 1000 fathoms, and the other at a point in the North Atlantic, dredged by the *Porcupine*, at 630 fathoms, where only a single specimen was taken. There are five species in the genus, but with the exception of a single specimen of an allied species taken by the *Challenger* off the Cape of Good Hope, the genus is only known as a North Atlantic type. The species discovered in the Victorian rocks is one of the rarest; its occurrence, therefore in the fossil condition in the Australian Tertiaries is a matter of some interest. The speaker stated that his researches with regard to the microzoa of the Australian formation led him to believe that many of the rarer arenaceous forms of foraminifera recently discovered in the deep seas, and which have been so beautifully illustrated by Mr. H. B. Brady in the Scientific Results of the *Challenger* Expedition, occurred as fossils in Australian geology from the Cretaceous formation downwards.—*English Mechanic*.

GEOLOGICAL NEWS.—*General*.—Prof. P. M. Duncan has contributed to the Quarterly Journal of the Geological Society an account of the structure of the ambulacra of some fossil genera and species of regular Echini, explaining the effects through generations of crushing upon the characters of the ambulacral plates, and the gradual formation of complicated ambulacral plates.—According to W. Dames and H. Woodward, some at least of the forms which have been described as Phyllopod-shields, from strata of Silurian, Devonian, and Carboniferous ages, are nothing

more than the opercula of *Goniatites*. Both agree, however, that for other forms this explanation is, according to our present knowledge, inadmissible. W. Dames, however, asserts that none are phyllopodous in their nature, a dogmatic opinion for which he is taken to task by the English palæontologist. They are, in fact, species of *Phyllocarida*, and not phyllopods.

Carboniferous.—Since 1878 no less than 1300 specimens of fossil insects have been obtained at Commeny, while all other localities have only furnished about 120 examples. These Commeny insects are remarkably well preserved, many of them being complete, instead of consisting of the wings only, as is often the case with insect remains. M. Ch. Brongniart (*Revue Scientifique*, 29 Aout, 1885) classifies these carboniferous insects as *Orthoptera*, *Neurorthoptera*, *Pseudo-neuroptera*, and *Hemiptera*. Among the *Orthoptera* are fifty specimens of *Dasyleptus lucasi*, an ancestral *Thysanouran*, and numerous *Palæoblattariæ* and *Palæaderidiodea*. The *Neurorthoptera* comprise the order of that name and the *Palæodictyoptera*; the first with the families *Protophasmida* and *Sthenaropterida*, and the second with the families *Stenodictyopterida*, *Hadrobrachypoda*, and *Platypterida*. The wings of *Archæoptilus lucasi* are twenty-five to thirty centimeters long, and those of *Eugereon* and other *Stenodictyopterida* are finely netted like those of dragonflies. The *Hadrobrachypoda* are regarded as ancestral types of the *Termites*. The *Platypterida* are entirely new. Their wings are broad, generally rounded at the end, and though morphologically like those of the *Protophasmida*, differ greatly in the nervation. The nerves are well separated, and the wings colored. Six families of *Pseudo-neuroptera* can be distinguished, the *Megascopterida*, *Protodonata*, *Homothetida*, and three others containing the ancestral types of the *Ephemeridæ*, *Perlidæ*, and *Ascalaphus*. The *Hemiptera* are represented by types of the *Fulgoridæ* and *Cicadidæ*.

Cretaceous.—Mr. J. S. Gardner denies the synchronism of a large part of the American Cretaceous with that of England. Whether the former are Cretaceous at all is debatable. The question whether a Cretaceous fauna extended into the Eocene, or an Eocene flora extended back to the Cretaceous is answered by Mr. Gardner in these words: "In support of the first proposition we have the innumerable survivals of old types at the present day, wherever the struggle for existence has been less severe, and the fact that the Cretaceous-looking types are largely mingled with others of a Tertiary facies. The Tertiary facies of the flora, on the other hand, is not diminished by the presence of any distinctly Cretaceous plants. I think all the evidence I have been able to bring forward is in favor of a newer rather than an older date, and this is decidedly more in harmony with the march of evolution."—Mr. J. S. Gardner (*Quart. Jour.*

Geol. Soc., Feb., 1884) describes the British Cretaceous Nuculidæ. Palæontology bears out the separation of the Nuculæ and Ledæ from the Arcidæ. He recognizes fifteen species of Nucula in the limits treated, ten of the group of Ovata, the remainder of the group Angulatæ. The Ledæ are ten in number. *Nucula meyeri*, *Nucula gaultina* and *Leda seeleyi* are new species.

Tertiary.—The third part of M. Gosselet's geological sketch of the north of France and the adjoining countries contain sixteen plates, and treats of the Tertiary period, which is divided into Eocene, Oligocene and Neogene. The following are enumerated as "Pretertiary continental formations": Vegetable soil (loam with lignite in its upper bed), flint conglomerate (sand with beneath it clay with flints), Pretertiary loam (loam, plastic clay and sand) and transported Pretertiary deposits. The Eocene is divided into Montian, Landenian, Ypresian and Parisian, the last characterized by *Rostellaria ampla*, *Nummulites lævigata* and *variolaria*, *Ditrupea strangulata*, and its glauconitic zone by *Pecten corneus*. In the Eocene of Northern France the only vertebrates known are *Arctocyon primævus* and *Pachynolophus maldani*, but the Oligocene has yielded Anthracotherium and many birds, also *Crassitherium robustum*, allied to Rhytina. M. Gosselet divides the Oligocene into Tongrian (principally marls and sands) and Rupelian (Beauce limestone). The Neogene is represented in Northern France and Belgium only by its upper or Pliocene beds.—The description of chilostomatous Bryozoa from Aldinga and the Murray Cliffs, S. Australia, by A. W. Waters, is still continued in the quarterly journal of the Geological Society. The number of fossil species now known is 220, just about half of which have been found living. They are principally from the Tertiary, but a few are Cretaceous.—E. T. Newton (*Geo. Mag.*, Aug., 1885,) describes some bones of a gigantic bird obtained from the Lower Eocene at Croydon, Eng. The most interesting portions are two large tibia-tarsi and parts of a femur. These bones very closely resemble the corresponding parts of *Gastornis parisiensis*, but present specific differences. The bird, which must have been as large and heavy in build as the *Dinornis crassus* of New Zealand, has been named *G. klaaseni* in honor of its discoverer, Mr. H. M. Klaasen.

Recent.—The two articles of Prof. J. D. Dana (*Amer. Journ. of Science*, Aug., Sept., 1885), are an able defence of the until recently almost universally accepted theory of the origin of coral reefs and islands by subsidence. The great number of atolls and barriers in all stages to be found in the deep belt of the Pacific, are shown to be inexplicable upon any other theory, while islands like the Marquesas, though without reefs, yield unmistakable evidence of the wide spread subsidence. The views of Darwin and Dana are shown to be those of men who had a wide

acquaintance with the general phenomena; it is admitted that local elevations occurred, and some of the widely isolated points thus elevated are enumerated, and other explanations of the phenomena are passed under review, but dismissed as either insufficient or actually confirmatory of Darwin's theory. The soundings of Mr. Murray off northern Tahiti, showing the rapid increase of depth beyond the forty fathom line until, at a mile from the shore, the slope of the ocean bottom was nearly that of the land, are shown to be exactly in accordance with the subsidence theory. The strongest evidence, derived from the writings of A. Agassiz and the soundings of the *Blake*, points to a great subsidence in the Florida region during the coral reef era, and the elongation of the coral reefs and formation of inner channels now going on by drifting coral sands is shown to be but a part of the sand-beach forming process which is in operation along the entire Atlantic coast of North America, from Long Island southward, and to in no way vitiate the evidence in favor of previous subsidence. The abrasion-solution theory of Semper seems to be negatived by the absence of open channels in the lagoons of the smaller atolls, moreover, instead of small lagoons having the purest waters, it is they which are most choked by coral sands.—Almost perfect skeletons of *Rhytina gigas* have been recently mounted in the National Museum, Washington, and in the British Museum.

MINERALOGY AND PETROGRAPHY.¹

NEW MINERALS.—*Gerhardite*.—Messrs. Wells and Penfield² have described natural crystals of a basic copper nitrate which was first identified by Professor Brush, of New Haven, on specimens of copper ore from the United Verde mines, Jerome, Arizona. The crystals, which belong to the orthorhombic system, are mainly made up of a large series of pyramids and the basal pinacoid. Twelve forms were observed. Color dark green; hardness 2; specific gravity 3.426. Plane of the optic axes is the brachypinacoid; double refraction very strong, negative; pleochroism distinct.

An analysis gave :

H ₂ O	CuO	N ₂ O ₅
11.26	66.38	22.25

Named after the chemist who first determined the composition of the same compound made artificially. This is the only insoluble nitrate known in nature.

Hanksite.—This name was suggested in May of the present year, by Mr. W. E. Hidden,³ for an anhydrous sulphato-carbonate

¹ Edited by Dr. GEO. H. WILLIAMS, of the Johns Hopkins University, Baltimore.

² *American Journal of Science*, July, 1885, p. 50.

³ *Ib.*, Aug., 1885, p. 133.